

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference 20887WO		FOR FURTHER ACTION See Form PCT/PEA/416	
International application No. PCT/NL2004/000062	International filing date (day/month/year) 28.01.2004	Priority date (day/month/year) 24.02.2003	
International Patent Classification (IPC) or national classification and IPC C07D251/62			
Applicant DSM IP ASSETS B.V. et al.			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 4 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 1 sheets, as follows:</p> <p style="margin-left: 20px;"><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p style="margin-left: 20px;"><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand 24.08.2004		Date of completion of this report 14.02.2005	
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer De Jong, B Telephone No. +31 70 340-2833	



**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/NL2004/000062

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-9 as originally filed

Claims, Numbers

1-8 received on 17.12.2004 with letter of 15.12.2004

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/NL2004/000062

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-8
	No: Claims	
Inventive step (IS)	Yes: Claims	1-8
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-8
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

PCT/NL2004/000062

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

Reference is made to the following document:

D2: WO 01/72722

Document D2, which is considered to represent the most relevant state of the art, discloses a method to crystallise a melamine melt by allowing the melt to drop through a sieve plate into liquid ammonia, from which the subject-matter of the claim 1 differs in that the melt is sprayed in the cooling liquid.

The subject-matter of claim is therefore new (Article 33(2) PCT). Furthermore it was not obvious starting from D2 to come to the process of the present application

AMENDED CLAIMS

1. Method for crystallising a melamine melt to form melamine particles with a D_{90} of at most 2 mm by cooling a melamine melt to below the crystallisation temperature of the melamine, comprising the formation of a suspension of melamine particles in the cooling medium by spraying the melamine melt with at most 10 wt% of CO_2 relative to the sprayed quantity of melamine melt in a space in which a layer of a liquid cooling medium is present that has a temperature below the crystallisation temperature of the melamine and under cooling conditions at which at least 50 wt% of the sprayed melamine melt directly turns into suspended melamine particles.
2. Method according to claim 1, with the cooling medium consisting of at least 90 wt% of liquid ammonia.
3. Method according to claim 1 or 2, with the temperature of the cooling medium being controlled by evaporation of the coolant.
4. Method according to one of the claims 1-3, with the temperature of the cooling medium being controlled by bringing it in contact with an environment with a lower temperature than the temperature of the cooling medium.
5. Method according to one of the claims 1-4, with the melamine melt being sprayed together with a gas as a two-phase flow.
6. Method according to one of the claims 1-5, characterised in that the melamine melt is sprayed directly in the cooling medium.
7. Method according to one of the claims 1-6, whereby the melamine particles are separated from the suspension of crystallised melamine in the cooling medium.
8. Method for manufacturing melamine from urea in a, preferably continuous, high-pressure process, comprising the reaction of urea to form melamine in a reactor at a pressure between 4 and 25 MPa and a temperature between 330 and 430 °C, separating the formed reactor product into a flow that consists principally of liquid melamine and a flow that consists principally of CO_2 , NH_3 and melamine vapour, crystallisation by cooling the liquid melamine, using a cooling medium, to below the crystallisation temperature at which solid melamine is formed and separating the solid melamine, characterised in that crystallisation takes place with the method according to one of the claims 1-7.